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Introduction

- Appendicitis is one of the most common medical emergencies worldwide⁹. Surgical removal of the appendix through appendectomy has been the definitive standard of care since the 19th century^{3,10,9}.
- However, due to the potential complications of surgery, researchers have begun to investigate a more conservative treatment of appendicitis through the use of antibiotics alone^{2,13,14,15}.
- The following PICOT question will be investigated: **How effective is antibiotic administration for the treatment of acute appendicitis compared to surgical appendectomy?**

Methods

Resources Utilized:

-PubMed, Cochrane Library, and Google Scholar were utilized.
-Uptodate and F1000 also used

Primary Search Terms:

“Appendicitis”, “Antibiotics”, and “Appendectomy”, “Appendix”, “Medications”, and “Treatment”

Alternative Search Terms:

“Appendix”, “Medications”, and “Treatment”

Inclusion Criteria:

-Only Systematic Review Papers
-Published after 2015
->1 year follow up with patients

Exclusion Criteria:

-RCT
-Published before 2015
-<1 year patient follow up

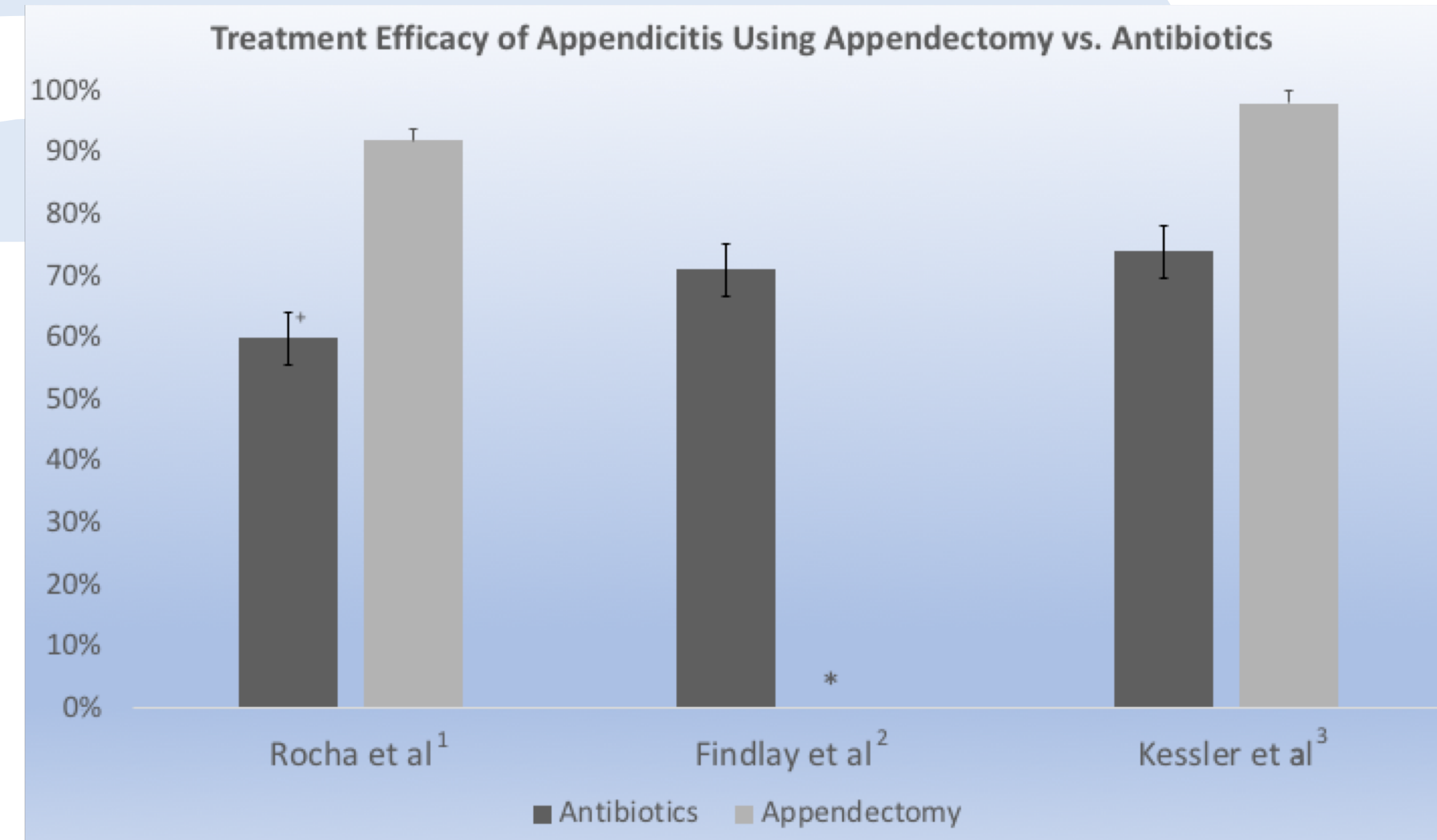
Analysis:

-The systematic reviews were critically analyzed using the GRADE bias evaluation

Results

Treatment of appendicitis using antibiotics was found to be effective 60-74% of the time.

Figure 1. Treatment Efficacy of Appendectomy versus Antibiotics



1. Treatment efficacy defined as overall treatment of appendicitis. 2. Definition of efficacy not specified 3. Treatment efficacy defined as resolution of appendicitis, readmission, and complications * Efficacy for treatment with appendectomy not provided + all confidence intervals at 95% unless otherwise stated

Table 1. Outcome Comparisons and Favored Result from Rocha et al¹², Kessler et al¹⁴, and Findlay et al¹³

Outcome	Rocha et al ¹²	Kessler et al ¹⁴	Findlay et al ¹³
Treatment Efficacy	Appendectomy Favored	Appendectomy Favored	Appendectomy Favored
Complications	Antibiotics Favored	No Difference	No Difference
Failure of Treatment	Appendectomy Favored	Appendectomy Favored	Appendectomy Favored
Readmissions	Appendectomy Favored	Appendectomy Favored	N/A
Length of Hospital Stay	No Significant Difference	N/A	Appendectomy Favored
Pain	Antibiotics Favored	N/A	Antibiotics Favored

Table 2. Grade Bias Evaluation of the Systematic Reviews Regarding Efficacy of Treatment of Acute Appendicitis with Antibiotics

	Inconsistency	Indirectness	Imprecision	Risk of Bias	Limitations	Quality
Findlay et al 2015	High Risk ¹	Moderate Risk ²	Low Risk	High Risk ³	High Risk ⁵	Very Low
Kessler et al	High Risk ¹	Low Risk	Low Risk	High Risk ⁶	High Risk ⁵	Very Low
Rocha et al 2017	Moderate Risk ⁸	Low Risk	Low Risk	High Risk ⁷	High Risk ⁵	Low

1. Rated as high risk due to high heterogeneity ($i^2 > 80\%$) in the studies 2. Rated as moderate risk due to variations in diagnostic criteria, inclusion, and exclusion criteria 3. Rated as high risk due to unclear randomization and unclear reporting of complications. Rated as moderate risk due to varying population parameters 5. Rated as high risk due to low quality of studies investigated and varying antibiotics 6. Rated as high risk due to allocation bias, variety of protocols within the studies 7. Rated as high risk due to selection bias from unblinded outcomes and crossover rate 8. Rated as moderate risk due to moderate heterogeneity and variation

Conclusions

Key Findings

Treatment with Antibiotics:

- Efficacy ranged from 60% to 74%.
- Decreased inflammatory response, faster return to work, and decreased pain.
- Higher rate of readmission compared to appendectomy

Appendectomy more effective compared to antibiotics

Limitations

- Design related bias
- Variations in antibiotics
- Imaging modalities used for diagnosis
- Length of follow up time

Clinical Applications

- Although antibiotic treatment may be appealing due to the decreased risk of complications and decreased pain, the rate of hospital readmission and treatment efficacy is worrisome.
- Of note, majority of the appendectomies were performed as open although laparoscopic is typically the gold standard today.

Conclusion/Future Directions

- The evidence supports **appendectomy as standard of treatment for acute appendicitis**
- More studies need to be completed standardizing study design, surgical modality, and increasing length of follow up time.

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